NEW DESCRIPTIONS

TWO NEW CYPRINID FISHES UNDER THE GENUS *GARRA* (HAMILTON) FROM KERALA, SOUTHERN INDIA

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Two new Cyprinid fishes under the genus *Garra* (Hamilton) have been described from river Periyar, Kerala. The morphometric and meristic characters of the two species varied from the species hitherto described. *Garra emarginata* sp. nov. is named after its emarginated caudal fin, while *Garra mlapparaensis* sp. nov. is named after its type locality. A key to the species under the genus *Garra*, reported so far from Kerala, is also provided.

Key words: *Garra emarginata* sp. nov., Pooyamkutty, *Garra mlapparaensis* sp. nov., Mlappara, Periyar river

INTRODUCTION

The genus *Garra* (Hamilton) is represented by 24 species in the Indian subcontinent (Jayaram 1999), of which 19 are distributed in India. Rema Devi and Indra (1984) described *Garra menoni* from Silent Valley, Kerala, India. *Garra kalakadensis* was subsequently described by Rema Devi (1992) from Kalakkad Wildlife Sanctuary, Tamil Nadu. Shaji *et al.* (1996) described *Garra surendranathani* from Chalakkudy, Periyar, Pamba and Achenkovil rivers of Kerala. Recently, *Garra periyarensis* was described by Gopi (2001) from the Periyar lake. The other species known from Kerala, so far, include *Garra gotyla stenorhynchus*, *G. mullya*, *G. lughi* and *G. mcclellandi* (Jayaram 1999). Barring *Garra menoni*, the other species were described from the streams of the Periyar river system (Arun *et al.* 1996; Zacharias *et al.* 1996). Recently, Radhakrishnan and Kurup (2007) reported *Garra ceylonensis* from Periyar river, which is the first record of this species from Indian waters. Thus, the total number of species recorded under genus *Garra* in Kerala is raised to eight While investigating the fish fauna of Periyar river as a part of the NAT-ICAR Project on Germplasm Inventory, Evaluation and Gene Banking of freshwater fishes, we came across specimens of two species with morphomeristics and coloration different from those of hitherto known species. These two species are reported as new additions to science.

MATERIAL AND METHODS

The specimens were collected with a cast net of 12 mm mesh size from two locations along Periyar river – Pooyamkutty and Mlappara. Morphometric measurements were recorded using a dial calliper, with an accuracy of 0.1 mm. Data are presented as percentages, with the range followed by the mean in parentheses. Meristic counts follow Talwar and Jhingran (1991).

Garra emarginata sp. nov. (Fig. 1)

Diagnosis: An elongate, slender species with an emarginated caudal fin, eyes small, interorbital region flattened, dorsal fin with 8 branched rays, lateral line complete with 35 scales, body with minute black spots arranged in series on either side of lateral line, distance between vent and anal fin 2.7-3.4 times that between anterior origin of anal and ventral fins.

Description: Based on 4 specimens collected from Pooyamkutty, Periyar river, ranging from 77.2 - 89.54 mm SL.

D.II, 8; P.I, 13; V.I, 7; A.I, 5; C.19.

Body elongate and slender. Depth of body 15.86-18.39% (17.19%) in SL, length of head 21.85-24.07% di3.40%) of SL, Mental disc well-developed, length of 5lsc 70.35-74.19% (72.27%) in width of disc and the latter

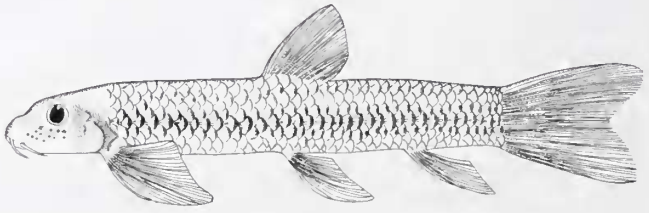

Fig. 1: Lateral view of *Garra emarginata* sp. nov.

51.38-65.12% (58.35%) in the width of head. Snout round and smooth. Two pairs of barbels; rostral barbels equal to or slightly greater than eye forming 102-112.69% (108.23%) of the eye diameter. Eyes small, not visible from ventral side of the head, diameter 17.08-18.83% (19.75%) of head length, 36.0-44.85% (38.28%) in the interorbital distance. Interorbital region flattened and 46.89-52.41% (49.2%) in the length of the head. Abdomen slightly rounded. Distance of the vent from anal fin origin 29.77-32.22% (30.33%) in the distance between anterior origins of ventral fin and anal fin. Caudal peduncle 10.91-12.48% in SL (11.25%), 44.44 -50.92% in HL and least depth 89.38-99.63% (92.46%) its own length.

Squamation: Thirty-five scales along the lateral line, 4.5 from the origin of dorsal to lateral line, 2.5 between the lateral line and pelvic fin origin, predorsal scales 11-12, preventral scales 13, preanal scales 26, circumpeduncular scales 12.

Fins: Dorsal fin inserted closer to snout than to caudal. It is shorter than head length, base 62.44-86.48% (75.63%) of the height. Pectorals larger than head and forms 106.88-130.13% (119.53%) in head length. Ventral fins almost equal or slightly larger than head and forms 89.37-106.02% (100.29%) in head length and 79.45-92.68% (86.25%) in pectoral fin length. Distance between pectoral and ventral fins 33.19-35.54% (34.46%) in SL. Distance between ventral and anal fins 26.62-32.16% (29.16%) in SL. Preanal distance 80.91%-87.4% (83.61%) in SL and predorsal distance 48.22-51.68% (49.08%) in SL. Preventral distance 52.06-55.39% (52.69) in SL and prepectoral distance 18.42-21.88% (20.42%) in SL. Caudal emarginate.

Holotype: Deposited at ZSI (WGRS) CLT. No. V/F 13033,115.26 mm TL, Pooyamkutty, Periyar river, 23.v.2003, Coll. Dr. K.V. Radhakrishnan.

Paratypes: 3exs. 107.4 mm, 102.3 mm and 97.5 mm TL, Pooyamkutty, Periyar river, 23.v.2003, Coll. Dr. K.V. Radhakrishnan. (Deposited at School of Industrial Fisheries Museum, Cochin University of Science and Technology, Regn No.1, 62a, 62b, 63c)

Coloration: In life, the ground colour is greyish green with the ventral side pale white. Minute dark spots arranged on either side of the lateral line in a series. Fins generally pale, orange red, dorsal rays have blackish tips. In formalin, the ground colour turns brown.

Distribution: INDIA: Kerala, Pooyamkutty on Periyar river.

Etymology: Named after the emarginated nature of the caudal fin that differentiates the species from other related species.

Remarks: The species, *Garra emarginata*, is different from its closely related species *G. hughi*, *G. surendranathani* and *G. periyarensis* in many respects. Unlike *Garra hughi*, the new species has prominent scales on the predorsal, breast and belly regions and presence of lesser number of lateral line scales. The species differs from *Garra periyarensis* in absence of a deep cut and knob-like protuberance in the snout and presence of scales on the breast and belly region. *Garra emarginata* lacks the characteristic black blotches of *Garra surendranathani*. It differs from *Garra mullya* in having more lateral line scales, broad and round head and snout, more flattened and wide interorbital region and smaller eyes when compared to head length. The new species can be differentiated easily from *Garra menoni* in the presence of more lateral line scales, presence of scales in the breast and belly regions, wide interorbital distance and in colour pattern, namely the new species possess minute dark spots arranged on either sides of the lateral line in a series. The emarginated nature of caudal fin differentiates the species under the Genus *Garra* inhabiting the Western Ghats region, however this character is shared with *G. manipurensis* recorded from Manipur. Nevertheless, *G. emarginata* can be differentiated from *G. manipurensis* by the morphometric characters such as presence of scales on the chest region, width of mental disc in relation to width of head and difference in lateral line scale counts, shape of head, colour pattern.

Garra mlapparaensis sp. nov. (Fig. 2)

Diagnosis: A species of *Garra* having an elongated and slender body, with dorsal fin having 7 branched rays, lateral line complete with 36 scales, scales on the lateral sides have blackish posterior ends, distance between vent and anal fin 3.15 times that of the distance between anterior origin of anal and ventral fins.

Description: Based on a single specimen 94.58 mm SL, collected from Mlappara, Periyar Tiger Reserve in Periyar river.

D.I-II, 7; P.I, 12; V.I, 7; A.I, 5; C.19.

Body elongate and slender, depth of body 18.64% in SL, length of the head 22.08% of SL, mental disc well developed, width of the disc 73.22% in the width of head. Snout rounded with fine tubercles. Barbels two pairs; rostral barbels slightly greater than diameter of eye and forming

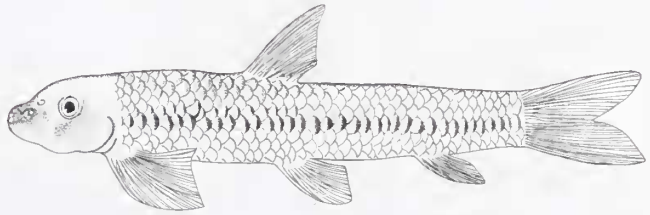

Fig. 2: Lateral view of *Garra mlapparaensis* sp. nov.

106.21% of the eye. Eyes moderate and not visible from ventral side of the head, diameter 21.20% of head length, 43.86% in the interorbital width. Interorbital distance 48.34% in the length of the head. Abdomen slightly rounded. Distance of the vent from anal fin origin 31.70% in that between anterior origin of ventral fin to anal fin. Caudal peduncle length 14.92 % in SL, 65.34% in head length and its least depth 77.49 % in its own length.

Squamation: 35 scales along the lateral line, 4.5 from the origin of dorsal to lateral line, 3.5 between lateral line and pelvic fin origin, predorsal scales12, preventral scales 13 and preanal scales 24, circumpeduncular scales 12.

Fins: Dorsal fin inserted closer to snout than to caudal, longer than head length, base 26.45 % of height. Pectorals almost equal to head length and form 98.70% in the latter. Pelvic fins smaller than head and form 89.26% in head length and 90.44% in pectoral fin length. Distance between pectoral and ventral fins 31.58% in SL. Distance between ventral and anal fins 24.40% in SL. Preanal distance 77.55% in SL and predorsal distance 45.39% in SL. Preventral distance 50.72% in SL and prepectoral distance forms 19.34% in SL. Caudal forked.

Coloration: In life, the ground colour is greenish-brown with the ventral side pale white. The posterior edges of the scales on the lateral sides are blackish. Fins generally orange red and the dorsal rays have blackish tips. In formalin, the ground colour turns brown.

Holotype: Deposited in ZSI (WGRS) CLT. No. V/F 13032 94.58 mm TL, Mlappara, Periyar, 18.ii.2002.

Paratypes: None.

Distribution: INDIA: Kerala, Mlappara, upstream of Periyar river.

Etymology: Named after the locality from where the specimen was collected.

Remarks: *Garra mlapparaensis* is closely related to *Garra hughi* in the number of lateral line scales, wide and well developed sucking disc, however, it differs from the latter in the presence of larger eyes and also in the position of insertion of dorsal fin, which is closer to the snout than to the caudal fin; the dorsal fin is equidistant from the snout and caudal fin in *Garra hughi*. It can be differentiated from *Garra periyarensis* in the absence of a deep cut at the snout, presence of scales on the breast and belly regions and placement of the vent, which is almost midway between the anterior origins of anal fin and ventral fins in the latter.

KEY TO SPECIES OF GENUS *GARRA* IN KERALA

1. Head with a single proboscis ..... *Garra gotyla stenorhynchus*
— Proboscis absent 2
2. Lateral line scales 34 or fewer, scales uniformly present on body 3
— Lateral line scales 35 or more, scales uniformly present on body or absent on ventral side 4
3. Interorbital distance more than 2 times in head length ..... *Garra ceylonensis*
— Interorbital distance less than or about two times in head length ..... *Garra mullya*
4. Snout with a deep transverse groove, vent placed almost midway between origins of anal fin and ventral fin 5
— No transverse groove present; if present, not deep. Vent not placed midway between origins of anal fin and ventral fins 6
5. Breast and belly scale less ..... *Garra periyarensis*
— Scales present uniformly on body ..... *Garra mcclellandi*
6. Lateral line scales 35-38, scales absent on a part of the body 7
— Scales present almost uniformly along the body 8
7. Lateral line scales 35-36, head less depressed, eyes 4.2-4.6 times in head length, depth of caudal peduncle form 1-1.2 times in its length and scales absent on breast and belly .... *Garra menoni*
— Lateral line scales 36-38, head more depressed, eyes 5.8-6 times in head length, caudal peduncle less deep, forming 1.2-1.4 times in its length, scales usually absent on mid-dorsal region ..... *Garra hughi*
8. Body brownish-green, scales on the lateral sides have dark posterior edges ..... *Garra mlapparaensis* sp. nov.
— Body with back blotches or minute spots arranged in a series 9
9. Body with black blotches and dots, head with minute tubercles, eyes larger, caudal forked ..... *Garra surendranathani*
— Body with minute dark dots arranged on either sides of the lateral line, eyes small, caudal emarginated ..... *Garra emarginata* sp. nov.

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